

## REMARKS

Applicant thanks the examiner for his attention to the application. Applicant has considered the cited references and amended the claims to forms believed distinguishable thereover. Independent claims 21, 40 and 41 have been rewritten as new claims 43, 46 and 47.

### **Section 2 of the action captioned "Drawings":**

With the deletion of the objectionable darkened, unnumbered member, the amendments to the attached marked-up drawings should be acceptable.

### **Section 3 of the action "Specification":**

A. The examiner objects under 35 USC §132(a) to the amendment to paragraph 0047 (i.e. A heated liquid passageway comprises continuous, unbroken of liquid channels 30, 31 and 32." The examiner asserts the continuous unbroken nature of the liquid passageway was not shown or described at the specification as filed. That such a description is fair and proper from the original specification is exemplified by the attached marked-up copies of Figures 2-6 and wherein the continuous and unbroken construction of the oil passageways 20-26 is shown in orange, the continuous and unbroken construction of the heated liquid passageways 30-32 is shown in blue, and the continuous and unbroken construction of the air passageways 40-42 is shown in pink. Otherwise, the description of the drawings at paragraphs 0038 through 0042 and discussion thereto at paragraphs 0046 through 0049 fully document, describe and depict the uninterrupted, continuous and unbroken continuity of the respective channels and which passageways as previously discussed are distinguishable over Watson.

Applicant has above amended paragraph 0047 to delete the reference to unbroken only, The reference to “continuous” remains to support the claims and distinction over Wilson. If the examiner continues his objection, he is requested for purposes of appeal to specifically identify where and how he find the reference to “continuous” lacking.

If the examiner is unable to interpret the drawings, it is suggested that he consult with the official draftsman to ascertain the clarity of the drawings and specification. Alternatively, an appropriate affidavit will be supplied by a draftsman confirming the foregoing.

B. With the deletion of the reference to seal 27 at the amendment to paragraph 0049, the specification should no longer be objectionable.

C. The specification at paragraphs 47 and 48 has been amended to include appropriate references to the narrowed air passageways 41 which are depicted at Figures 3 and 4 and shown in pink at the attachments discussed above and provide antecedence for the claims..

D. As indicated earlier, the specification at paragraph 49 has been amended to overcome an inadvertent oversight regarding the underlining of the new text. As presently amended proper antecedence is believed provided for the claimed second channel or cavity 26.

**Sections 5 and 6 of the action:**

Claims 21-24, 27, 30, 32 and 41 stand rejected under 35 USC §112 for lack of support under the specification. The claims have been amended to overcome the objections.

In regard to claims 21, 24 and 41 and the lack of disclosure to “continuous, unbroken” oil, heated liquid and air channels, the attached marked-up figures 2-6 clearly

depict the nature of the channels 20-26; 30-32; and 40-41 as constituting “continuous” paths. Moreover the terms are used in their conventional sense and as defined in any number of dictionaries and therefore the examiners assertions of new matter appear unfounded.

If the examiner is interpreting the terminology under some other definition than the ordinary definition of “continuous”, he is requested to specifically point out where he disagrees or in what manner new matter exists. Mere disagreement to avoid applicants use of the term to distinguish over Watson is otherwise believed inappropriate.

Otherwise, the undersigned, who is an engineer and commonly reads drawings, is mystified where or how the originally filed specification (i.e. paragraphs 47-49) and drawings do not support the presented language. Applicant therefore requests the examiner to withdraw his objection.

In regard to the objection to claims 22 and 27, applicant has amended the claims to overcome the objection to the reference to “port” as the examiner interprets the term. Only a single air passageway 43 is now claimed, although the original disclosure of paragraph 48 clearly states “air atomizing nozzles have compressed air **passageways**.”

In regard to the objection to the claims and the recitation to a “seal”, applicant has amended the claims to delete such references and the claims should no longer be objectionable on that basis.

**Section 9 of the action:**

Claims 21-24, 26, 27, 30, 32 and 40-42 stand rejected as being obvious under 35 USC §103 over Wilson (5,156,139) in view of Leach (2,976,918) and Bender (5,067,894).

Wilson is cited for showing an oil burner having electric heater passageway 14, air passageway 16, an oil conveying passageway 22, and an air atomizing nozzle 8.

In regard to the continuity of the passageway 22, the continuity of Wilson's passage exists only upon the fastening of the plugs 30 to the manifold. Wilson's fuel passage 22 is defined by input 22a and **broken and discontinuous** channel segments 23. A continuous fuel flow path is established only upon fitting the plugs 30 to the block to establish the connecting segments 24 and 25.

Applicant's continuous, convoluted, and unbroken oil channels 20-26 are **directly formed into his manifold**. Applicant does not require plugs to facilitate cleaning, since applicant's burner assembly does not experience the formation of carbon deposits experienced by Wilson and other burners with electric heaters.

As regards the presence of a cavity in Wilson's oil passageway 22, only the enlarged unnumbered cavity is shown that receives the nozzle 8. The asserted second, cavity is positioned aft of the larger cavity.

The air channel 16 otherwise to exhibits a continuous cross section without any narrowed region and also intersects the asserted second aft cavity, which in fact comprises the oil channel 22B, through the side wall of the channel 22B and posterior the nozzle 8. **Wilson therefore does not provide any teaching to either Applicant's forward mounted second cavity which contains the air channel 43 and/or Applicant's narrowed air passages 41 that communicate with his second cavity 42 and both of which features are provided for at the amended claims in various claimed combinations with an air atomizing nozzle having an air channel 43 located at the second cavity 42.**

In regard to the electric heater passageway 14, the passage 14 is shown to be straight and without any convolutions and provides a single open end that receives a heater element. The opposite end of the passage 14 is closed. The input and output ends 30 and 32 of Applicant's liquid channel 30-32 are both exposed to couple to the source of heated water. No suggestion or motivation exists from Wilson to modify the channel to receive a heated liquid. The disclosure at column 6, line 60 through column 7, line 8 in fact teaches away from such a modification and suggests only water contact with the exterior of the block assembly 10 in combination with the continuing unmodified use of the heater element.

In regard to the nozzle 8, even if the nozzle 8 performs a similar function to that of applicant, the air is admitted into the side of passage 22B and fuel oil aft of the nozzle 8. The air is not admitted into a second cavity coaxially or concentrically aligned forward of a first cavity as claimed by applicant. Moreover, applicant's narrowed venturi type air passages 41 are not provided for at Wilson or any of the other references.

In regard to Wilson's heat source, column 5, lines 47-55 and column 6, lines 38-42 refer to "heating elements" and do not specifically state the elements are electric elements. Applicant asserts those skilled in the art understand such elements to be electric elements as noted at the attached affidavits of Mssrs. Wiersgalla, Kuhn, and Dunn. The lack of an outlet end at the passageway 14 further suggests that the Wilson's heat element is not liquid based.

To overcome the deficiency of Wilson to teach or suggest the use of a liquid (i.e. water based) heat source, the examiner refers to Leach and incorrectly asserts Leach teaches an "oil burner assembly". Leach in fact teaches a **preheater for heavy oils**,

column 1, lines 43-66. Nowhere does Leach describe or intend that his unit be used to elevate the temperature of his heated fuel oil to a combustible temperature at the burner nozzle. His device is constructed and intended only to raise the temperature of the oil sufficiently to flow from a storage tank 32 to a remotely located burner 100 or furnace 101, column 2, lines 53-55, and neither of which devices are shown or described.

Leach's fuel **preheater** is intended only to partially raise the temperature of the fuel oil to facilitate fuel flow as it is directed to an associated burner. Leach does not disclose or suggest an integral, igniter/oil burner assembly, heated with liquid passed through bored channels of a solid manifold containing a fuel nozzle and igniter at the burner.

Leach in particular teaches a **bath type** assembly wherein only fuel supply and return lines 34 and 39 are surrounded by a bath of heated water. A housing 12 constructed from a section of pipe is configured to contain the boiler water. The water bath surrounds the oil containing conduits 34, 39. The purpose of the preheater is to **partially elevate** the temperature of the oil to permit circulation by oil pump 54 via water circulated through the housing 12 by pump 70. The assembly is not intended to be mounted in combination with an igniter and/or directly at a burner. **Assemblies of the type shown by Leach are typically 10-12 inches in diameter and extend 2-4 feet in length as noted in the attached Affidavit of Mr. Dunn.**

In the examiner's attempt to transition and justify the combination of the teachings of Leach into Wilson, the examiner **misinterprets and/or quotes out of context** Leach's stated object at col. 1, lines 43-47 which states

*“An object of this invention, therefore, is to provide a fuel oil fired heating system that is simple in construction and efficient in operation and which will overcome the aforementioned difficulties. ”*

The aforementioned difficulties as stated at column 1, lines 21-34 are specifically referenced as follows:

*“When oil is cold, it becomes so thick that it does not readily flow through the supply lines and in some cases actually blocks the passage of oil therethrough even under very high pressures. This makes it quite difficult to maintain a constant or proper flame in the furnace and increases wear on the mechanical parts of the system. Certain ones of the systems proposed for overcoming these difficulties have relied upon **electrical or gas heater units disposed adjacent to certain parts of the fuel oil supply line** to heat the oil as it flows towards the burner, but these do not uniformly heat the oil so as to maintain the oil flowing to the burner at a substantially constant temperature so that uniform control of the flame cannot be maintained.”*

The foregoing passages demonstrate that Leach is solely interested in raising the temperature of a heavy fuel oil to flow through supply lines from a storage container remotely located from a burner. The citation to column 1, lines 43-47 nor any other passage at Leach provides any motivation or suggestion to modify Wilson to include a heated liquid source such as taught by Leach in lieu of Wilson’s heating element.

**At page 12 of the examiner’s argument, the examiner also incorrectly states Leach heats air passageways when in fact Leach discloses no air passages.**

As regards the examiner's citation to Leach's comments at column 6, line 60 through column 7, line 8 that Wilson's nozzle assembly 10 can be secured "within a hot water tank" or that "water need only be made to flow over or surround the surfaces which define all of the heat exchange volumes", the comments suggest at most an external bath type arrangement. Water contact is suggested only with the external surfaces of the complete assembly 10 and not with the interior of the channel 14 as proposed by the examiner.

**More significantly, the comments suggest at most a combination of Wilson's complete and unmodified assembly 10 with an adjacent bath assembly of indefinite construction.** Thus Wilson's assembly 10 would still include a heating element. Wilson's suggestion is also indefinite in terms of any actual construction of the device, especially in view of the non-specific sealing comment and comment to "means used to transfer heat from hot exhaust gases to the water to be heated", among others. The passage therefore suggests an adaptation that would require undue experimentation and not the simplistic, out-of-context modification argued by the examiner.

The examiner's simplistic adaptation/modification and assertion of merely directing a flow of heated water through the passage 14 in Wilson therefore does not follow from any teaching, suggestion or motivation in either Wilson or Leach alone and/or in combination. Applicant earlier and again from the foregoing has properly and fairly considered the teachings of Wilson and Leach alone and in combination and believes the examiner's asserted adaptation/modification appears is a hindsight reconstruction that is not fairly supported from the references.



In short, nothing in the cited references alone or in combination discloses or suggests providing heated liquid passageway(s) within a solid manifold supporting a nozzle to heat fuel oil directed through the manifold to a combustible temperature at discharge of the oil from the nozzle and combustion. Nor do the cited references alone or in combination teach the concurrent heating of atomizing air with a heated liquid source and especially not within a manifold having passageways, cavities etc. as constructed and as claimed by applicant.

In further support to the non-obviousness of applicant's invention over the cited combination of Wilson with Leach and Bender and in view of the failure of the examiner to acknowledge the earlier submitted letters of skilled artisans, attached are affidavits with attachments from Mr. Wiersgalla, Mr. Kuhn and Mr. Dunn. Each affiant has more than 20 years of experience in the art, has reviewed the application, cited references and is personally familiar with each of the devices of Wilson, Leach and Bender. Each affiant believes the asserted combination of extracted portions of Leach and modification with Wilson is not supported by the references and practical experience. It is requested that the examiner review and acknowledge his review of the affidavits.

The thermal conductivity of applicant's manifold body is such that heat is readily transferred from the liquid to the oil and air. The manifold body provides machined continuous, convoluted oil directing passageway(s) 20-26 (fig. 5), continuous heated liquid passageway(s) 30-32 (fig. 3) and continuous atomizing air passageway(s) 40-42 (figs. 3,4) that include cavities to support a nozzle (i.e. air atomizing or hi pressure oil). Narrowed venturi type air passageways 41 are also provided.

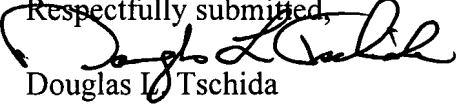
The passageways are provided in displaced tiers. The oil directing passageway(s) 20-26 are provided at a lower level that lies parallel to and directly adjacent the heated liquid passageway(s) 30-32. The riser channel 25 extends through the level containing the heated liquid passageway(s) 30-32. The cavities 26 and 42 are coaxially and/or concentrically aligned to support the nozzle and associated air and oil directing channels to obtain appropriate discharge characteristics.

The foregoing distinctions are particularly provided for at the amended independent method claim and apparatus claims. That is, each claims a manifold having internal, tiered channels/passageways that couple to sources of oil, heated liquid and air to an associated nozzle and igniter. The manifold and passageways are configured such that heat from the heated liquid is transferred via the manifold material to heat the oil and air immediately prior to being discharged from a nozzle.

Where the nozzle includes atomizing ports, a source of air is coupled to the third passageway. The air is heated by thermal transfer from the manifold material and atomizes the hot oil upon discharge from the nozzle.

With the foregoing amendments to the specification, drawings and claims, the application is believed distinguishable and patentable over the art and in a condition for allowance. No new matter has been entered with any of the foregoing amendments. Applicant requests the examiner's reconsideration of the application and an early notice to the allowance thereof.

If any matters remain that can be handled with a telephone conference, the examiner is encouraged to contact the undersigned.

Respectfully submitted,  
  
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Enclosures

